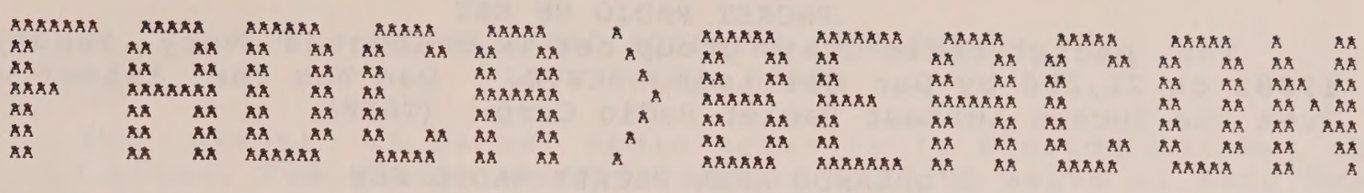

The Florida Amateur Digital Communications Association Newsletter
Vol. 1, No. 1 Brandon, FL January 1984

The Florida Amateur Digital Communications Association is an informal organization devoted to the promotion of experimentation in digital modes of amateur communication. FADCA was formed by members of the two Florida packet radio Beta Test Groups of the Tucson Amateur Packet Radio Corp. (TAPR). They felt a need exists for an organization that serves the information needs of the digital experimenter and which can coordinate the development of digital communication networks in this region. There are many repeater organizations and local radio clubs, but they seldom provide a forum for the expression of technical and especially computer related ideas. The national publications and large groups like TAPR and AMRAD (Amateur Radio Research and Development Corp.) serve well to provide a common national frame of reference. What is needed is broader than local (city/county) clubs yet small enough to concentrate on area concerns.

FADCA members are actively involved in conducting seminars about packet radio and establishing local packet networks within the state. Other member activities include participation in projects to interconnect local packet networks by methods such as HF, meteor scatter, and satellite linking. Many are on RTTY and use landlines to participate in bulletin boards and other information services.

Membership in FADCA is granted to anyone expressing the desire to join and participate in FADCA activities. If you would like to take part in this organization please fill out and return the membership registration form on the back page. We are asking for a $10.00 membership fee to cover the expenses of newsletter publication (producing this issue of the newsletter cost about $60.) A full accounting of all funds received and all expenses will be published. The most valuable portion of the membership form is the part where you give your ideas, your activities and plans, offers of participation in FADCA activities, and names of others to be contacted. A more formal organization including a constitution and by-laws will be established when warranted by growth in membership. At present, I am accomplishing all of the administration of the association. This newsletter will be published regularly as finances and my time allow, and as material to publish is received from you.

Statewide packet frequency: 147.465

(813) 689-3355 after 8 PM EST

Gwyn Reedy, W1BEL
812 Childers Loop
Brandon, FL 33511

PACKET RADIO HF NET

The packet radio users group net is conducted every Sunday at 1900Z on 21,280 by Dan Morrison, KV7D. Dan has the latest news from the Tucson Amateur Packet Radio Corp. (TAPR).

ORLANDO AREA PACKET RADIO NET

Jim Diggs, K4AHO, will conduct a net about packet radio each Sunday evening at 9 PM on the Lake Monroe ARC repeater, 147.285 (+6).

SEMINAR SCHEDULE

FADCA conducted two packet radio seminars in December. The first, at Tampa Electric's plaza in downtown Tampa, was attended by over 25 area amateurs, and the second, at the meeting of the Avon Park Radio Club drew more than 30 attendees. Each seminar consisted of showing the videotape, "INTRODUCTION TO PACKET RADIO" produced by the Central Iowa Technical Society, a discussion period, and a demonstration of packet radio equipment in operation. A similar demonstration was held at Altamonte Springs on January 3rd at the Lake Monroe Amateur Radio Society meeting. The videotape will be shown at the Highlands County ARC (Sebring) Club meeting on January 16th. FADCA will be represented at the Sarasota, Miami, and Orlando hamfests. A presentation is planned for the Metro Repeater Club in Largo on February 23rd. To discuss a presentation, call or write to the address on the first page.

WHAT IS PACKET RADIO? (Adapted from TAPR literature.)

Packet radio is a communication system in which information is digitally encoded. In this respect it is similar to RTTY or ASCII, but with important differences. These differences are the key to insuring error-free reception and at the same time allowing maximum use of the spectrum through shared frequency use.

Data integrity is provided by packet radio through a "handshaking" technique and error correction. Along with each transmission, a computed value called a "frame check sequence" (FCS) is sent, which allows the receiving station to check for errors. The receiving station acknowledges an error-free packet with a special acknowledgement (ACK) signal. If the sending station does not receive such a signal within a certain period of time, it automatically retransmits the packet.

A packet also contains identification of the destination station, permitting several QSOs to take place on the same frequency. A packet radio station can automatically ignore any packets which are not addressed to it. Due to the fact that the duration of most packet transmissions is very short, a user does not need the channel most of the time. The time between transmissions is available to other users.

Several excellent articles have been published recently which go into much greater detail on packet methods and techniques:

Borden and Rinaldo. "The Making of an Amateur Packet-Radio Network." QST, Oct 81.
Johnson. "Join the Packet-Radio Revolution." 73, Nov-Dec 83, Jan 84.
Morrison and Morrison. "Amateur packet radio." Ham Radio, Jul-Aug 83.
Rosner. "Packet Communications in the Amateur Radio Service." CQ, Nov 82.

PACKET RADIO ACTIVITY IN FLORIDA

Gwyn Reedy, W1BEL

The extent of packet radio activity in Florida may not be fully known. Two groups were formed in 1982 to serve as Beta Test Sites for the Tucson Amateur Packet Radio Corp. Ted Huf, K4NTA, organized the Treasure Coast Beta test group with six members and Gwyn Reedy, W1BEL, formed the Brandon-Tampa Beta Test Group with five members. There were 13 TAPR TNCs delivered to Florida for Beta testing, five to the Tampa area, seven to the Stuart area, and one to Gulf Breeze near Pensacola. There are no records to indicate how many Vancouver TNCs were purchased and put into operation, but two are in Brandon. One is operational and one is destined to become a dedicated digipeater. One FADCA member in Brandon (KB4ZS) has chosen to go with the software approach on his TRS-80 model I. Someone is expected to get a packet board from GLB Electronics. At least 15 TAPR TNC kits are on order and that number is growing daily. If you know of people engaged in packet activity or interested in getting started, please refer them to FADCA.

Callsigns and QTH of amateurs believed to be obtaining packet radio equipment as of this writing: Jim, WD0EEL, Boca Raton; Bill, WD4IXI, Tampa; Dave, N4HWW, St. Petersburg; Brad, WD8ZPE, Brandon; Keith, N4ZQ, Brandon; Phil, WW4I, St Petersburg; Jim,W4APV, StPetersburg; Bill, K4RHD, Seminole; Art, K4HFL, New Port Richey; Bob, N4APC, Sebring; Larry, KE4PM, Avon Park; Hal, K4IFH, Avon Park; Larry, WD4BMN, Altamonte Springs; Jim, K4AHO, Orlando; N2WX, Melbourne area; KC5RF, Orlando area; Jack, KF4WM, Orlando; Sparky, N4BQE, Orlando.

THE TRS-80 SOFTWARE APPROACH TO PACKET RADIO OPERATION

Bill Adams,KB4ZS
3214 King William Cir, Seffner,FL 33584 (813) 681-2272

The TRS-80 can now be operated in the packet radio mode with off-the-shelf software. Bob Richardson of Richcraft Engineering has taken the time and effort to complete this task for the TRS-80 Models I & III computers. To quote Bob, "even the software approach requires some hardware. This hardware may vary from the extremely simple to the extremely exotic." The minimum requirements are:

1. A port zero encoder/decoder.
2. A 1200 baud AFSK modulator.
3. A 1200 baud AFSK demodulator.
4. A 2 meter rig or other RF equipment of your choice.
5. For Model III only, a Model III to Model I bus adaptor.

Bob also states that the Model I may require a buffered cable. My Model I does not work without it and I have one on order. The port zero encoder/ decoder can be a home brew project. Prints for it and for the modulator/ demodulator (MODEM) are in the manual. The modem may be home brewed, purchased as a kit from several sources, or used commercial modems may be purchased quite reasonably.

The manual is priced at $22.00 and the disk at $29.00 for double-sided, or $35.00 for two single sided. The double sided disk I received did not have an operating system on it. If you have only one drive, you could be in a bit of a fix. I am not sure how

only one drive, you could be in a bit of a fix. I am not sure how the two disk system is sold. The version I received supports only the Vancouver protocol, but the AX.25 version is due out in January and I plan to upgrade right away.

All in all, I have been very inpressed with the work Bob has accomplished. His manual is very well written (and about one inch thick). The software looks good on the screen, and as soon as I have the buffered cable in my hot, grubby hands I fully intend to join my friends in Brandon and around the state in the packet mode of operation. It has impressed me very much and appears that it will be a fun mode of operation and most of us will likely learn a lot from it. 73's and good 'packet racket' to all... Bill, KB4ZS

TRS-80 software by: Richcraft Engineering Ltd. (716) 753-2654
#1 Wahmeda Industrial Park, Chautauqua, NY 14722
Buffered interface cable and port zero encoder/decoder:
Alpha Products (212) 296-5915
85-71 79th St., Woodhaven, NY 11421

BRANDON-TAMPA BETA TEST GROUP
Bill Sams, KF4LG

The Brandon-Tampa Beta Test Group received their TNCs at the end of March 1983. The five members of the group were Gwyn Reedy, W1BEL, Jim Yost, W4ORA, Pat Shaughnessy, KF4EF, Lyman Duggan, VE3ILW, and Bill Sams, KF4LG. When we first got our boards and the thick instruction manual, interfacing to our computers and radios seemed like an impossible task. However, with some experimentation and many errors, we finally managed to send and receive a few packets. At first, the reliability was low and our frustration was high. As we gained experience and knowledge of the commands, we progressed to a very smooth working and fun-filled mode of communication.

With all the diversions of summer, we drifted into inactivity. But with summer vacations over, activity resumed and we continued to learn more of what the Beta boards could do. Various members of the group have experienced radio and computer problems, but the TAPR TNC boards have proven to be very reliable. We have put on packet demonstrations for the Brandon Amateur Radio Society, for a group that gathered in response so flyers circulated at the Tampa and Clearwater hamfests, and to the Avon Park Radio Club. These have sparked a lot of interest and we expect to see a number of new people on packet before very long.

With the conclusion of the Beta test, we have changed our name to Florida Amateur Digital Communications Association which we feel better expresses our purpose and future directions for experimentation. Goals that we plan to pursue are computer to computer file transfer and remote control of computers, computer bulletin boards for the exchange of information, linking of local packet networks by meteor scatter and microwave links, satellite communication on OSCAR 10 and PACSAT, and in the very near future, the linking of our packet group with the group in and near Stuart, Florida via direct two meter link or through digipeaters.

METEOR SCATTER EXPERIMENTS TO LINK LOCAL PACKET NETWORKS

Gwyn Reedy, W1BEL

Meteor scatter or meteor burst (METSCAT) propagation is often used by government and commercial agencies to communicate reliably over paths that are difficult to link with other modes. Amateurs have been using meteor trails to communicate for decades via carefully timed high speed CW or SSB during meteor showers. Professional communicators have exploited the mode via microprocessor controlled terminals that hold outgoing messages in a buffer and send them through little by little as conditions allow. The receiving terminal collects the portions of the message and when it is complete, displays it to the operator. This method of communication may be very useful for providing low capacity connectivity between geographically separated packet radio networks. Other methods of accomplishing the linking, such as HF, are also possible.

Billions of meteors vaporize in the upper atmosphere daily. Each one leaves a trail of ions which reflect radio waves for a few seconds until the trail dissipates. Enough ionized trails occur at any time and place to allow an intermittent signal path to exist. Automatic equipment can take good advantage of this path by transmitting high speed bursts of data when a circuit exists, and verifying the accuracy of the data and obtaining retransmission of missed or erronious data. Some literature suggests that a throughput similar to a landline teletype circuit (45 bauds) is possible if a 1200 bauds burst is used.

The value of METSCAT in linking packet networks is yet to be determined. The low data throughput rate would preclude the real time high speed data transfer that makes packet operation so useful. Other linking methods such as AMTOR on HF would have similar throughput. Packet HF links might possibly have a higher throughput, but more experimentation will be required to determine that. The promise of METSCAT lies in two areas. While any HF based mode is very dependent on day to day propagation conditions, METSCAT operates best when the band is 'closed.' Therefore the throughput is constant, only improving when meteor showers occur. Band openings may cause trouble due to interference, but experimentation will shed more light on that. In contrast, AMTOR has a maximum throughput less than METSCAT and any interference or bad propagation reduces it further. Packet activity on HF also is dependent on propagation and is more subject to interference. Finally, METSCAT works best in the 30-50 MHz range and is therefore able to take advantage of the higher data rates authorized for six meters. If high speed modems are developed at amateur prices, the circuit throughput may be increased by a factor of eight, giving a baseline throughput of over 300 bauds. That rate would be very useful for linking of isolated networks and to backup higher speed links. The type of modems needed are under development by members of AMSAT.

Groups in Iowa , Massachusetts, Nevada and here in Florida are planning METSCAT linking experiments. Central Florida is located at the near maximum METSCAT range from the Iowa and Mass. sites, and is thus ideal for evaluating the viability of long-haul METSCAT work. For more information contact me directly.

PACKET NEWS FROM THE EAST COAST
Ted Huf, K4NTA

Here in the Stuart area we have the following stations active as of this writing: WD4BRF, KF4I, and K4NTA. KA4VWW's 2 meter rig had to go back to the factory for repair but he should be back on soon. W2KGV is working out the interface to his TRS80-CC and radio and should be on in a few days. We are all using the TAPR Beta boards.

I operate a packet radio computer bulletin board service with a TRS-80 Model III on my station when it is not being used for keyboard talking. The CBBS is on all other times.

Sometime in January we will be installing a digipeater here in Stuart. I received a donation of a GE Mastr base station from the Martin County Sheriff's Dept, which will be used for the digipeater. I have it retuned and in operation now from my house. The digipeater will be at a CATV tower with the antenna at about 200 feet. I plan to operate it remotely from my house via the cable TV system. (By the way, I work for the cable company!)

We have tried to make connection with the fellows in the Tampa/ Brandon area on 2 meters ever since we got our Beta boards but no success until December 28th. I took my TNC and model III to a friend's house who has a good beam and a 170 watt amp on 2 meters. Conditions were only average but we made the 130 mile path. I was able to connect directly to W1BEL and KF4LG and by digipeating via KF4LG to N4ZQ (TNC borrowed from KF4EF.) I also downloaded a 100 line BASIC program to W1BEL while digipeating via KF4LG. The unfortunate thing was that the beam I was suing was so sharp that I could not copy the local stations in Stuart so they could digipeat through me to Tampa. The main thing that we found out was that there is some room for improvement in the Beta board modem. The TAPR kit modem has been improved and we are looking forward to the Beta upgrade kit that is under development.

We welcome the formation of the Florida Amateur Digital Communication Association and I am sure that it will be of benefit to all Florida hams with an interest in digital communication, whether packet radio or other modes.

WHAT WILL PACKET ACTIVITY BE LIKE A YEAR FROM NOW?
Gwyn Reedy, W1BEL

At the rate at which amateurs are now ordering packet radio gear in the central Florida area, a year will probably see over 100 active packeteers within reach of each other. Stations will routinely connect with others all over the state. The TAPR version 3.1 software (AX.25) supports digipeating through up to eight stations. If two-meter FM simplex signals can reliably cover a 30 mile path with omnidirectional antennas, then a 270 mile packet QSO will be possible with no special equipment. Longer distances will be possible since most stations have greater than a 30 mile range. Beam antennas increase the range in one direction at the expense of coverage in other directions, so they may not always be advantageous for long distance digipeating, except at both ends of the connection. For shorter paths, one station with a good signal into a distant location (and with an equally good received signal) can link all other local stations to the distant point. An exciting prospect is for one satellite-capable packet station to serve

as a gateway into the satellite for other packet stations lacking the satellite gear. The TAPR v 3.1 software also supports full duplex packet operation to take full advantage of the satellite capabilities. The gateway station would require more than one packet TNC and several transceivers and antenna systems for efficient operation. Back to a year-ahead prediction: numerous computer bulletin boards/MSOs will be in operation around the state with automatic updating of some boards from telephone bulletin boards. This newsletter will not be needed to keep active packeteers informed and will serve to educate potential packet operators and inform people outside the Florida area. (The newsletter of the St. Louis Amateur Packet Radio club has already been converted to electronic (packet) media only.) Meteor scatter tests will be underway, but regular connectivity to distant locations will not yet be possible. HF packet operation will connect some of our members with other centers of packet activity from time to time, and transcripts of the contacts will be captured and made available for all to review on some of the bulletin boards. A few stations will have made packet connections through one of the satellites and others will be gearing up to do the same thing. The one packet frequency will continue to be the meeting place for most packet activity, but due to the level of activity, some computer oriented and bulletin board activity will move to dedicated frequencies. Some voice repeaters will be allowing packet operation, especially on the bands higher than two meters where activity is less. Work will be in progress to link Florida with locations up the coast via a microwave or UHF backbone of dedicated digipeaters.

Sound exciting? Perhaps I'm not a good prophet, but all these things and much more are going to happen sooner or later. Be involved from the start and help make them happen.

FADCA MEETING/PICNIC PROPOSED

Ted, K4NTA, has proposed that FADCA members plan a picnic meeting in a central location such as Avon Park or Sebring. The meeting could be a nice way to meet the other people that are involved in packet activities and a chance to demonstrate packet operation to interested newcomers. Your comments on this suggestion and ideas about locations and dates are invited.

THE NEXT NEWSLETTER

The next newsletter will be published when more information is accumulated. Your letters, articles, small items of information, requests for information, etc. will make the next issue of great value and allow it to be published soon. Please send in your membership form right away and include lots of material for publication.

Persons wishing to receive further information about packet radio and packet operation should send a large SASE (with at least 37 cents postage) to the FADCA address below.

FLORIDA AMATEUR DIGITAL COMMUNICATIONS ASSOCIATION MEMBERSHIP REQUEST

I am interested in joining FADCA and in receiving the newsletter.

NAME_____ CALLSIGN_____

LICENSE CLASS ____ TAPR MEMBER? Y/N OTHER MEMBER? _____

STREET_____

CITY_____ STATE_____ ZIP_____

PHONE (H) (_____)_____ (W) (_____)_____

FREQUENCIES WHERE I CAN BE FOUND:_____

I OPERATE: RTTY? Y/N AMTOR? Y/N OTHER _____. TYPE OF COMPUTER?

_____.

PACKET GEAR OWNED OR ON ORDER? Y/N TYPE:_____.

SUGGESTIONS, PROPOSALS, COMMENTS, NAMES OF OTHER INTERESTED PERSONS:

_____

_____

_____

_____

_____

_____

Mail this form and your membership dues to the return address below.

_____

GWYN REEDY, W1BEL
812 Childers Loop
Brandon, FL 33511